

TABLE 23-continued

| Sample | Cellulose | KOH:CAA | CAA:Cellulose | DS | AUL (g/g) | | |
|--------|-----------|-------------|---------------|----|-----------|---------|---------|
| | | Molar Ratio | Molar Ratio | | 0 days | 12 days | 20 days |
| 211 | ITT | 2.2:1 | 0.75:1 | — | 13.3 | 14.4 | 14.9 |
| 212 | ITT | 2.2:1 | 1.0:1 | — | 17.3 | 16.9 | 18.4 |

As can be seen, for example, by comparing Samples 207 and 212, the use of potassium hydroxide as compared to using sodium hydroxide results in a carboxymethyl cellulose that exhibits both a high initial Absorbency Under Load value and exhibits aging stability.

Sample No. 213 and 214 are prepared using a less than stoichiometric amount of alkali, as indicated by the molar ratio of alkali to chloroacetic acid used being less than 2:1. Sample No. 215 to 222 are prepared using less modifying agent, as indicated by the molar ratio of chloroacetic acid to cellulose used being less than 1:1.

Table 24 provides the reaction conditions and the absorbency values of the prepared samples.

TABLE 24

| Sample | Cellulose | NaOH:CAA | CAA:Cellulose | DS | AUL (g/g) | | |
|--------|-----------|-------------|---------------|------|-----------|---------|---------|
| | | Molar Ratio | Molar Ratio | | 0 days | 12 days | 20 days |
| 213 | ITT | 1.8:1 | 0.75:1 | 0.65 | 12.6 | — | — |
| 214 | ITT | 1.8:1 | 1.00:1 | 0.84 | 17.2 | — | — |
| 215 | ITT | 2:1 | 0.75:1 | 0.76 | 17.1 | — | — |
| 216 | ITT | 2.2:1 | 0.60:1 | — | 17.2 | — | — |
| 217 | ITT | 2.5:1 | 0.50:1 | — | 16.2 | — | — |
| 218 | SC | 2.2:1 | 0.60:1 | — | 16.1 | — | — |
| 219 | SC | 2.2:1 | 0.40:1 | — | 11.8 | — | — |
| 220 | CR#21 | 2.2:1 | 0.50:1 | — | 19.2 | 18.7 | 18.9 |
| 221 | CR#21 | 2.2:1 | 0.40:1 | — | 13.7 | — | — |
| 222 | CR#18 | 2.2:1 | 0.50:1 | — | 17.0 | — | — |

Samples 208 and 214–217 are also placed in a temperature and humidity controlled environment. The temperature is maintained at about 23° C. and the humidity is maintained at about 100 percent relative humidity. The samples are tested for AUL value, at 0.3 psi, at various points throughout an aging study. The results are set forth in Table 25.

TABLE 25

| Sample No. | AUL Value (g/g) | | | | |
|------------|-----------------|---------|---------|---------|---------|
| | 0 days | 12 days | 40 days | 52 days | 77 days |
| 208 | 14.5 | 14.5 | 15.1 | 14.8 | 14.8 |
| 214 | 17.2 | 14.6 | 14.3 | — | — |
| 215 | 17.1 | 15.0 | 17.4 | — | — |
| 216 | 17.2 | 15.8 | 16.6 | — | — |
| 217 | 16.2 | 14.8 | 15.6 | — | — |

Example 11

Carboxymethyl cellulose (Aqualon CMC-7H4F) is dissolved in distilled water to give 2 weight percent solutions and mixed using a commercial Hobart mixer run at low to medium speed. The solutions are dried at 80° C. overnight in a convection oven and ground and sieved. A post heat-treatment, at a temperature of 226° C. for various lengths of time, is used to crosslink the samples. These samples are

placed in a temperature and humidity controlled environment. For Samples 223–228, the temperature is maintained at about 37.8° C. and the humidity is maintained at about 80 percent relative humidity. For Samples 229–234, the temperature is maintained at about 25° C. and the humidity is maintained at about 100 percent relative humidity. The samples are tested for AUL value, at about 0.3 psi, at various points throughout an aging study. The results are set forth in Table 26.

TABLE 26

| Sample # | Heat-Treatment Time (sec) | AUL Value (g/g) | | |
|----------|---------------------------|-----------------|---------|---------|
| | | 0 days | 10 days | 20 days |
| 223 | 40 | 22.9 | 12.8 | 9.57 |
| 224 | 50 | 22.6 | 19.8 | 11.5 |
| 225 | 60 | 23.6 | 19.7 | 18.4 |
| 226 | 70 | 18.4 | 22.3 | 22.1 |
| 227 | 80 | 17.2 | 23.5 | 21.7 |
| 228 | 90 | 15.1 | 20.3 | 21.9 |
| 229 | 40 | 22.9 | 12.8 | 10.9 |
| 230 | 50 | 22.6 | 16.8 | 11.1 |
| 231 | 60 | 23.6 | 20.7 | 12.8 |
| 232 | 70 | 18.4 | 22.2 | 20.7 |
| 233 | 80 | 17.2 | 24.1 | 21.6 |
| 234 | 90 | 15.1 | 22.2 | 22.1 |

While the present invention has been described in terms of the specific embodiments described above, numerous equivalent changes and modifications will be clear to those skilled in the art. Accordingly, the specific examples set forth above are not intended to limit, in any manner, the scope of the invention as set forth in the appended claims.

What is claimed is:

1. A method for producing a water-swellaable, water-insoluble carboxyalkyl polysaccharide, the method comprising the following steps: